DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

TE6CH
Revision 13
Allison Engine Company, Inc.

AE 3007C	AE 3007A1
AE 3007A	AE 3007A1/3
AE 3007A1/1	AE 3007A1P
AE 3007A1/2	AE 3007A3

July 28, 2000

TYPE CERTIFICATE DATA SHEET NO. TE6CH

Engine models described herein conforming with this data sheet (which is part of Type Certificate No. TE6CH) and other approved data on file with the Federal Aviation Administration, meet the minimum standards for use in certified aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Federal Aviation Regulations provided they are installed, operated, and maintained as prescribed by the manufacturer's FAA approved manuals and other FAA approved instructions.

Type Certificate Holder: Allison Engine Company, Inc.
Indianapolis, Indiana 46206-0420

Models (See Note 11): AE3007C, AE3007A, AE3007A1/1, AE3007A1/2, AE3007A1, AE3007A1/3, AE3007A1P, AE3007A3 direct drive turbofan engine, modular design, single stage fan, 14 stage axial compressor, annular combustor, 2-stage gas generator turbine, 3-stage low pressure turbine, bottom mounted accessory gearbox, two single channel full authority digital electronic controls.

RATINGS (see Note 1):	AE 3007C (P/N 23057202)	AE 3007A (P/N 23054002)	AE 3007A1/1 (P/N 23070002)	AE 3007A1/2 (P/N 23070443)
Takeoff (5 min.):				
Static thrust, lbf	6,442	7,580	7,580	7,580
Fan shaft speed, rpm	7,376	7,750	7,716	7,823
Gas generator speed, rpm	15,388	15,452	15, 603	15,842
Maximum Continuous:				
Static Thrust, lbf	6,442	6,820	6,820	6,820
Fan Shaft Speed, rpm	7,376	7,441	7,404	7,548
Gas Generator Speed, rpm	15,388	15,204	15,366	15,619
FAN SHAFT ROTATION: (aft looking fwd)	CCW	- -	- -	- -

*

Page No.	1	2	3	4	5	6	7	8
Rev. No.	13	12	13	13	13	13	12	12

LEGEND :
"- -" indicates "same as previous model"
"---" indicates "not applicable"
"N/A" indicates "not applicable"
NOTE:
Significant changes are black-lined in the left margin

RATINGS (see Note 1):	AE 3007A1 (P/N 23070991)	AE 3007A1/3 (P/N 23070402)	AE 3007A1P (P/N 23070401)	AE 3007A3 (P/N 23070412)
Takeoff (5 min.):				
Static Thrust, lbf	7,580	7,580	8,338	7,201
Fan Shaft Speed, rpm	7,903	7,903	8,059	7,600
Gas Generator Speed, rpm	16,013	16,013	15,953	15,329
Maximum Continuous:				
Static Thrust, lbf	6,820	6,820	6,820	6,820
Fan Shaft Speed, rpm	7,613	7,613	7,613	7,430
Gas Generator Speed, rpm	15,778	15,778	15,778	15,191
FAN SHAFT ROTATION: (aft looking fwd)	CCW	- -	- -	- -

PRINCIPAL DIMENSIONS OF BASIC ENGINE:	AE 3007C (P/N 23057202)	AE 3007A (P/N 23054002)	AE 3007A1/1 (P/N 23070002)	AE 3007A1/2 (P/N 23070443)
Length (overall), in.	115.08	- -	- -	- -
Width (max), in.	46.14	- -	- -	- -
Height (max), in.	55.70	- -	- -	- -
C. G. location, dry*				
• Station, inches	93.58	93.82	- -	- -
• Butt Line, inches	99.87	99.87	- -	- -
• Water Line, inches	97.71	97.65	- -	- -
WEIGHT (dry), lb.:	1,614	1,615	1,625	- -

PRINCIPAL DIMENSIONS OF BASIC ENGINE:	AE 3007A1 (P/N 23070991)	AE 3007 A1/3 (P/N 23070402)	AE 3007 A1P (P/N 23070401)	AE 3007 A3 (P/N 23070412)
Length (overall), in.	- -	- -	- -	- -
Width (max), in.	- -	- -	- -	- -
Height (max), in.	- -	- -	- -	- -
C. G. location, dry*				
• Station, inches	- -	- -	- -	- -
• Butt Line, inches	- -	- -	- -	- -
• Water Line, inches	- -	- -	- -	- -
WEIGHT (dry), lb.:	- -	- -	- -	- -

*C.G. Reference: Station = Engine Axial Station (Inlet flange = 47.908 in.); Butt Line 100.00 = Engine Horizontal Centerline; Water Line 100.00 = Engine Vertical Centerline

ENGINE CONTROL SYSTEM (major components) (see Note 9):

- Lucas Aerospace Full Authority Digital Electronic Control (FADEC), Qty. 2.
- Lucas Aerospace Fuel Pump & Metering Unit (FPMU), Qty. 1.
- Lucas Aerospace Compressor Variable Geometry (CVG) actuator, Qty. 1.

	AE 3007C (P/N 23057202)	AE 3007A (P/N 23054002)	AE 3007A1/1 (P/N 23070002)	AE 3007A1/2 (P/N 23070443)
Fuels:	Kerosene, commercial turbine fuel conforming to: MIL-T-5624, Grade JP-4 and JP-5, or MIL-T-83133, Grade JP-8, or ASTM D1655, Jet A/A-1 and Jet B, GOST 10227-86 TS-1 and RT.	- -	- -	- -
Lubrication Oil:	Synthetic oil conforming to ~~MIL-L-23699D~~ MIL-PRF-23699F and subsequent or ~~MIL-L-7808K~~ MIL-PRF-7808L (below -40°F) and subsequent.	- -	- -	- -
Ignition System:	BF Goodrich Aerospace, Engine Electrical Systems Division dual capacitance discharge, high energy type exciters, dual igniter plugs.	- -	- -	- -
Certification Basis:	14 CFR Part 33 dated February 1, 1965, with Amendments 1 through 14 inclusive and 14 CFR Part 34.	14 CFR Part 33 dated February 1, 1965, with Amendments 1 through 15 inclusive and 14 CFR Part 34.	14 CFR Part 33 dated February 1, 1965, with Amendments 1 through 15 inclusive and 14 CFR Part 34.	14 CFR Part 33 dated February 1, 1965, with Amendments 1 through 15 inclusive and 14 CFR Part 34.
	Original application for Type Certificate dated May 24, 1990, amended December 22, 1992. Type Certificate No. TE6CH, issued February 28, 1995.	Original application for Type Certificate dated May 10, 1994. Type Certification No. TE6CH amended November 27, 1996.	Original application for Type Certificate dated March 5, 1998. Type Certification No. TE6CH amended April 15, 1998.	Original application for Type Certificate dated March 17, 1998. Type Certification No. TE6CH amended June 15, 1998.
Production Basis:	Production Certificate No. 310	- -	- -	- -

	AE 3007A1 (P/N 23070991)	AE 3007A1/3 (P/N 23070402)	AE 3007A1P (P/N 23070401)	AE 3007A3 (P/N 23070412)
Fuels:	- -	- -	- -	- -
Lubrication Oil:	- -	- -	- -	- -
Ignition System:	- -	- -	- -	- -
Certification Basis:	14 CFR Part 33 dated February 1, 1965, with Amendments 1 through 15 inclusive and 14 CFR Part 34.	14 CFR Part 33 dated February 1, 1965, with Amendments 1 through 15 inclusive and 14 CFR Part 34.	14 CFR Part 33 dated February 1, 1965, with Amendments 1 through 15 inclusive and 14 CFR Part 34.	14 CFR Part 33 dated February 1, 1965, with Amendments 1 through 15 inclusive and 14 CFR Part 34.
	Original application for Type Certificate dated June 17, 1998. Type Certification No. TE6CH amended November 6, 1998.	Original application for Type Certificate dated Dec 15, 1998. Type Certification No. TE6CH amended May 27, 1999.	Original application for Type Certificate dated Dec 15, 1998. Type Certification No. TE6CH amended August 6, 1999.	Original application for Type Certificate dated Dec 15, 1998. Type Certification No. TE6CH amended September 7, 1999.

Production Basis:	- -	- -	- -	- -

NOTE 1.
Engine ratings are based on:

AE 3007C, AE 3007A, AE 3007A1/1, AE 3007A3 (P/N 23057202, P/N 23054002, P/N 23070002, P/N 23070412)	AE 3007A1/2 (P/N 23070443)	AE 3007A1, AE 3007A1/3 (P/N 23070991, P/N 23070402)	AE 3007A1P (P/N 23070401)
Sea level static, 29.92" Hg	- -	- -	- -
Flat rated to 86°F (ISA+27°F, ISA+ 15°C) inlet temperature	Flat rated to 100.4°F (ISA+41.4°F, ISA+23°C) inlet temperature	Flat rated to 113°F (ISA+54°F, ISA+30°C) inlet temperature	Flat rated to 93°F (ISA+34°F, ISA+19°C) inlet temperature
100% inlet pressure recovery	- -	- -	- -
Exhaust nozzle area (A9) of 670.1 $in.^2$	- -	- -	- -
Zero relative humidity	- -	- -	- -
No inlet air distortion	- -	- -	- -
No customer bleed extraction	- -	- -	- -
No external power extraction	- -	- -	- -
No anti-ice airflow	- -	- -	- -

NOTE 2:

	AE 3007C (P/N 23057202)	AE 3007A (P/N 23054002)	AE 3007A1/1 (P/N 23070002)	AE 3007A1/2 (P/N 23070443)
Temperature Limits:				
Measured Interstage Turbine Temperature (same as T4.5 and ITT)				
Takeoff (5 minutes)	1630°F	1690°F	1690°F	1738°F
Maximum Continuous	1562°F	1600°F	1605°F	1653°F
Starting	1472°F	1472°F	1472°F	1472°F
Oil Inlet Temperature:				
Maximum	260°F	- -	- -	- -
Minimum	-40°F ~~(MIL-L-23699)~~ (MIL-PRF-23699)	- -	- -	- -
	-65°F ~~(MIL-L-7808)~~ (MIL-PRF-7808)	- -	- -	- -
Minimum to increase N2 above 83%		104°F	104°F	104°F
Fuel Pump Inlet Temperature:				
Minimum	-65°F, or that temperature corresponding to a fuel viscosity of 22 centistokes, whichever is higher **	- -	- -	- -
Maximum steady state	135°F	- -	- -	- -

	AE 3007A1 (P/N 23070991)	AE 3007A1/3 (P/N 23070402)	AE 3007A1P (P/N 23070401)	AE 3007A3 (P/N 23070412)
Temperature Limits:				
Measured Interstage Turbine Temperature (same as T4.5 and ITT)				
Takeoff (5 minutes)	1738°F	1738°F	1738°F	1738°F
Maximum Continuous	1653°F	1653°F	1653°F	1653°F
Starting	1472°F	1472°F	1472°F	1472°F
Oil Inlet Temperature:				
Maximum	260°F	- -	- -	- -
Minimum	-40°F ~~(MIL-L-23699)~~ (MIL-PRF-23699)	- -	- -	- -
	-65°F ~~(MIL-L-7808)~~ (MIL-PRF-7808)	- -	- -	- -
Minimum to increase N2 above 83%	104°F	104°F	104°F	104°F
Fuel Pump Inlet Temperature:				
Minimum	-65°F, or that temperature corresponding to a fuel viscosity of 22 centistokes, whichever is higher **	- -	- -	- -
Maximum steady state	135°F	- -	- -	- -

** For environmental operating restrictions, refer to AE 3007C Installation Design Manual (CSP 34011) or AE 3007A Installation Design Manual (CSP 34021) or AE 3007A1/1 Installation Design Manual (CSP 34073) or AE 3007A1/2 Installation Design Manual (CSP 34074) or AE 3007A1 Installation Design Manual (CSP 34070) or AE 3007A1/3 Installation Design Manual (CSP 34075) or AE 3007A1P Installation Design Manual (CSP 34077) or AE 3007A3 Installation Design Manual (CSP 34076).

External Engine Component Maximum Temperatures:

For the maximum component operating temperatures, refer to AE 3007C Installation Design Manual (CSP 34011) or AE 3007A Installation Design Manual (CSP 34021) or AE 3007A1/1 Installation Design Manual (CSP 34073) or AE 3007A1/2 Installation Design Manual (CSP 34074) or AE 3007A1 Installation Design Manual (CSP 34070) or AE 3007A1/3 Installation Design Manual (CSP 34075) or AE 3007A1P Installation Design Manual (CSP 34077) or AE 3007A3 Installation Design Manual (CSP 34076).

NOTE 3.

	AE 3007C (P/N 23057202)	AE 3007A, AE 3007A1/1, AE 3007A1/2, AE 3007A1, AE 3007A1/3, AE 3007A1P, AE 3007A3 (P/N 23054002, P/N 23070002, P/N 23070443, P/N 23070991, P/N 23070402, P/N 23070401, P/N 23070412)
Maximum Permissible Speeds:		
Low Pressure Turbine, rpm	8,700	8,700
High Pressure Turbine, rpm	16,123	16,270

NOTE 4.
Oil Pressure Limits (psig)

Models	Minimum below 88% N2 (N2 < 14000 rpm)	Minimum above 88% N2 (N2 ≥ 14000 rpm)	Maximum[1][2]	Maximum ~~Transient~~ [3][4]	Maximum[5][6]
AE 3007C	34	48	95	~~—~~ N/A	N/A
AE 3007A	—34	—48	—95	115	155
AE 3007A1/1	—34	—48	—95	—115	155
AE 3007A1/2	—34	—48	—95	—115	155
AE 3007A1	—34	—48	—95	—115	155
AE 3007A1/3	—34	—48	—95	—115	155
AE 3007A1P	—34	—48	—95	—115	155
AE 3007A3	—34	—48	—95	—115	155

[1] For oil temperature > 70°F
[2] No time limit
[3] ~~Use limited to Takeoff Thrust Setting(s) only~~Reserved
[4] Duration limited to 5 minutes maximum
[5] Compliance with Service Bulletin AE 3007A-79-025 or equivalent required
[6] Duration limited to 2 minutes maximum

Fuel Pump Inlet Pressure:

Minimum, psig	For Jet A, A-1/JP-5, refer to: AE 3007C Installation Design Manual, Section 1 (CSP 34011).	For Jet A, A-1/JP-5, refer to: AE 3007A or AE 3007A1/1 or AE 3007A1/2 or AE 3007A1 or AE 3007A1/3 or AE 3007A1P or AE 3007A3 Installation Design Manual, Section 1 (CSP 34021 or CSP 34073 or CSP 34074 or CSP 34070 or CSP 34075 or CSP 34077 or CSP 34076).
	For Jet B/JP-4, refer to: AE 3007C Installation Design Manual, Section 1 (CSP 34011).	For Jet B/JP-4, refer to: AE 3007A or AE 3007A1/1 or AE 3007A1/2 or AE 3007A1 or AE 3007A1/3 or AE 3007A1P or AE 3007A3 Installation Design Manual, Section 1 (CSP 34021 or CSP 34073 or CSP 34074 or CSP 34070 or CSP 34075 or CSP 34077 or CSP 34076).
Maximum, psig	55	- -

NOTE 5.
Accessory Drive Provisions:

Accessory	Direction of Rotation	Speed Ratio	Normal Load*** (HP)	Cyclic Overload Load*** (HP)	Failure Overload Load*** (HP)	Max Shear Torque (in.lb)	Max Overhung Moment (in. lb.)
Generator 1	CW, FLA	0.745	23.5	43.5	- -	1600.	300
Generator 2	CW, FLA	0.745	23.5	43.5	- -	1600.	300
Hydraulic pump	CW, FLA	0.473	13.0	37.3	42	1840.	160

*** The maximum total accessory horsepower extraction for all thrust settings and flight conditions is 60 HP. An overload limit of 80 HP is permitted for a period of 5 minutes at all thrust settings and all flight conditions below 45,000 feet. Cyclic overload defined as 5 min/1 hour of operation. Failure overload defined as 1 min/10,000 hours of operation.

NOTE 6.
For the AE 3007C, the maximum permissible bleed flow rate is 7.0% of core air flow for the 8th stage and 12% of core air flow for the 14th stage when each stage is opened independently. The maximum permissible total bleed air extraction is 17.5% of core air flow when both stages are opened simultaneously.

For the AE 3007A, the maximum permissible bleed flow rate is 8.5% of core air flow for the 9th stage and 10.5% of core air flow for the 14th stage when each stage is opened independently. The maximum permissible total bleed air extraction is 18.0% of core air flow when both stages are opened simultaneously. The maximum permissible fan-bypass bleed air flow is 90 lbm/min.

For the AE 3007A1/1, AE 3007A1/2 , AE 3007A1, AE 3007A1/3, AE 3007A1P, and AE 3007A3 the maximum permissible 9th stage bleed flow is 7.9% of core air flow for the 9th stage and 9.3% of core air flow for the 14th stage when each stage is opened independently. The maximum permissible total bleed air extraction is 16.5% of core air flow when both stages are opened simultaneously. The maximum permissible fan-bypass bleed air flow is 90 lbm/min.

NOTE 7.
Mandatory replacement times (life limits) established for critical components and mandatory airworthiness inspections for the AE 3007C, AE 3007A, AE 3007A1/1, AE 3007A1/2, AE 3007A1, AE 3007A1/3, AE 3007A1P, and AE 3007A3 are published in the Chapter 5 of the noted Maintenance Manuals:

AE 3007C	AE 3007A, AE 3007A1/1, AE 3007A1/2, AE 3007A1, AE 3007A1/3, AE 3007A1P, AE 3007A3
(P/N 23057202)	(P/N 23054002, P/N 23070002, P/N 23070443, P/N 23070991, P/N 23070402, P/N 23070401, P/N 23070412)
CSP 34012	CSP 34022

NOTE 8.
The accessory gearbox mounted accessories provided as part of the engine include:

- Permanent Magnetic Alternator (PMA)
- Fuel Pump & Metering Unit (FPMU)
- Oil Pump

Additional accessory gearbox mounting pads are also provided on the engine for:

- engine starter
- two (Qty. 2) aircraft electrical generators
- aircraft system hydraulic pump

NOTE 9.
Aircraft mounted engine control equipment consists of two (Qty. 2) FADEC assembly units, associated sensors, and equipment as defined in the following Turbofan Engine Assembly Drawings:

AE 3007C	23057202 revision CW and later
AE 3007A	23054002 revision DM and later
AE 3007A1/1	23070002 revision AD and later
AE 3007A1/2	23070443 revision H and later
AE 3007A1	23070991 revision E and later
AE 3007A1/3	23070402
AE 3007A1P	23070401
AE 3007A3	23070412

For P/N 23066394 FADECs, the following restrictions apply:
(a) Do not attempt a takeoff with corrected fan speed below 73.56% (6400 rpm).
(b) Data from aircraft Air Data Computer (ADC) must be continuously available to the engine for compliance with 14 CFR 33.77(b). ADC data must be provided from sources that are physically, electrically, and pneumatically isolated.

NOTE 10.
Criteria pertaining to the dispatch and maintenance requirements for the AE 3007A, AE 3007A1/1, AE 3007A1/2, AE 3007A1, AE 3007A1/3, AE 3007A1P, and AE 3007A3 engine control system are specified in Chapter 5 of the AE 3007A Series Maintenance Manual, CSP 34022, which defines the various configurations and maximum operating intervals.

NOTE 11.
Model Description:

The AE 3007C, AE 3007A, AE 3007A1/1, AE 3007A1/2, AE 3007A1, AE 3007A1/3, AE 3007A1P, and AE 3007A3 engines are direct drive turbofan engines of modular design which incorporate a single stage fan connected to a three-stage low pressure turbine. The engines incorporate a 14-stage axial compressor with variable vanes (including inlet guide vanes) for the first six stages, an annular combustor, and a two-stage high pressure turbine. The engines have a full length composite outer duct. The engines include fore and aft mounting provisions which permit underwing pylon or aft fuselage mounting installation.

The following are differences between the models:

	AE 3007C (P/N 23057202)	AE 3007A, AE 3007A1/1, AE 3007A1/2, AE 3007A1, AE 3007A1/3, AE 3007A1P, AE 3007A3 (P/N 23054002, P/N 23070002, P/N 23070443 P/N 23070991, P/N 23070402, P/N 23070401, P/N 23070412)
Fan Blades	P/N 23060567 (Type III)	P/N 23061623 (Type IV)
High Pressure Compressor Bleed	8th stage	9th stage
Fan Bypass Bleed	None	Yes
Rear Mount Support Ring	Rotatable Position	Fixed Position
Fuel Flow Meter - Allison Supplied	No	Yes

...END...